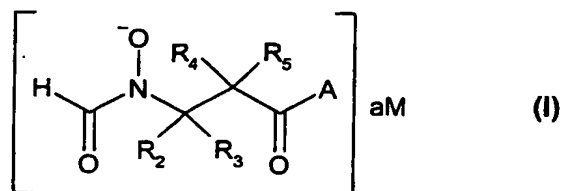


CLAIMS:

1. A crystalline salt of formula (I):



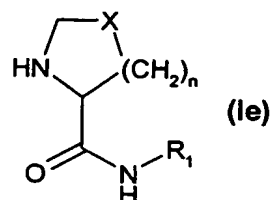
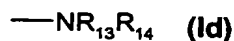
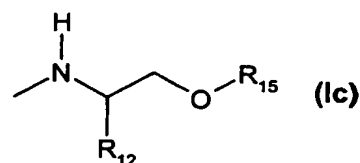
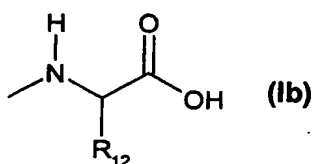
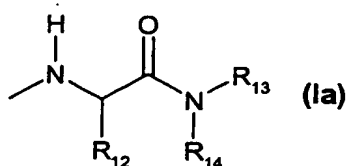
wherein

M is a mono- or di-valent metal;

a is $\frac{1}{2}$ or 1;

each of R_2 , R_3 , R_4 and R_5 , independently, is hydrogen or an aliphatic group, or (R_2 or R_3) and (R_4 or R_5), collectively, form a C_4 - C_7 cycloalkyl;

A is of the formula (Ia), (Ib), (Ic), (Id) or (Ie)



wherein

R_{12} is the side-chain of a natural or a non-natural alpha amino acid;

R_{13} and R_{14} , independently, represent hydrogen, or optionally substituted C_1 - C_8 alkyl, cycloalkyl, aryl, aryl(C_1 - C_8 alkyl), heterocyclic or heterocyclic(C_1 - C_8 alkyl);

R_{15} is hydrogen, C_1 - C_8 alkyl or an acyl group;

X is $-\text{CH}_2-$, $-\text{S}-$, $-\text{CH}(\text{OH})-$, $-\text{CH}(\text{OR})-$, $-\text{CH}(\text{SH})-$, $-\text{CH}(\text{SR})-$, $-\text{CF}_2-$, $-\text{C}=\text{N}(\text{OR})-$ or $-\text{CH}(\text{F})-$, wherein R is alkyl;

R_1 is aryl or heteroaryl; and

n is 0-3, provided that when n is 0, X is $-\text{CH}_2-$.

2. The crystalline salt of Claim 1, wherein A is formula (Ie).

3. The crystalline salt of Claim 3,

wherein

a is $\frac{1}{2}$; and

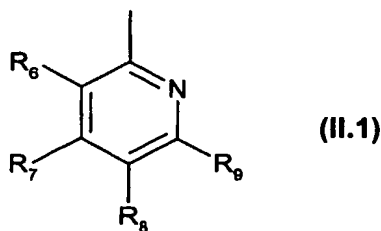
M is Ca, Zn or Mg.

4. The crystalline salt of Claim 2 or 3,

wherein

A is of formula (Ie); and

R₁ is a heteroaryl of formula (II.1)



wherein

R₆, R₇ and R₉ are hydrogen; and

R₈ is methyl or trifluoromethyl; or

R₆, R₇ and R₈ are hydrogen; and

R₉ is fluoro; or

R₆, R₈ and R₉ are hydrogen; and

R₇ is ethyl or methoxy; or

R₇, R₈ and R₉ are hydrogen; and

R₆ is hydroxy; or

R₇ and R₈ are hydrogen;

R₆ is methoxy; and

R₉ is methyl.

5. The crystalline salt of Claim 4,

wherein

R₆, R₈ and R₉ are hydrogen; and

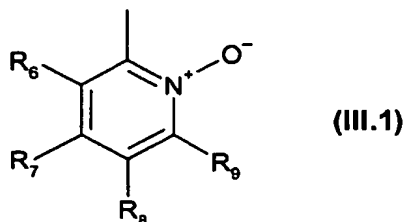
R₇ is ethyl.

6. The crystalline salt of Claim 2 or 3,

wherein

A is of formula (Ie); and

R₁ is of the formula (III.1)



wherein

R₆, R₇ and R₉ are hydrogen; and

R₈ is fluoro or trifluoromethyl; or

R₆, R₈ and R₉ are hydrogen; and

R₇ is ethyl.

7. The crystalline salt of Claim 6,

wherein

R₆, R₇ and R₉ are hydrogen; and

R₈ is fluoro.

8. The crystalline salt of Claim 7,

wherein

a is ½; and

M is Ca, Zn or Mg.

9. The crystalline salt of Claim 1, containing at least 2% water.

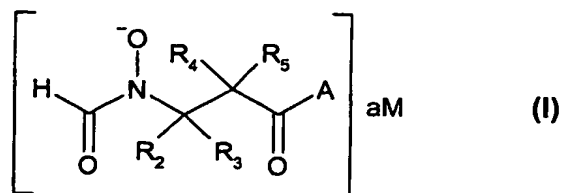
10. The crystalline salt of Claim 1, containing about 8% water to about 9% water.

11. The crystalline salt of Claim 1, wherein the X-ray powder diffraction pattern comprises crystalline peaks with 2-theta angles (Cu-K_α radiation) at least five of the following positions:

6.8 ± 0.1, 13.7 ± 0.1, 12.2 ± 0.1, 14.5 ± 0.1, 15.2 ± 0.1, 18.1 ± 0.1, 20.6 ± 0.1, 22.0 ± 0.1, 22.4 ± 0.1, 24.5 ± 0.1 and 30.9 ± 0.1.

12. A hydrated crystalline magnesium salt of 1-{2-*R*-[(formyl-hydroxy-amino)-methyl]-hexanoyl}-pyrrolidine-2-*S*-carboxylic acid (5-fluoro-1-oxy-pyridin-2-yl)-amide, in particular a corresponding tetrahydrate salt.

13. A process for preparing a crystalline salt of the formula (I)



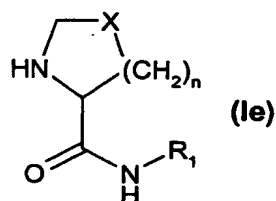
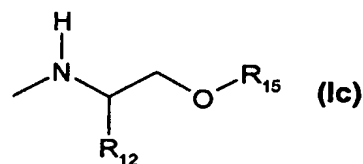
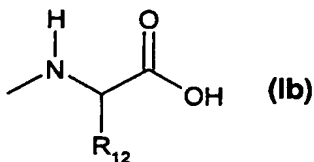
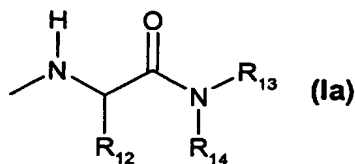
wherein

M is a mono- or di-valent metal;

a is ½ or 1;

each of R₂, R₃, R₄ and R₅, independently, is hydrogen or an aliphatic group, or (R₂ or R₃) and (R₄ or R₅), collectively, form a C₄-C₇cycloalkyl;

A is of the formula (Ia), (Ib), (Ic), (Id) or (Ie)



wherein

R₁₂ is the side-chain of a natural or a non-natural alpha amino acid;

R₁₃ and R₁₄, independently, represent hydrogen, or optionally substituted C₁-C₈alkyl, cycloalkyl, aryl, aryl(C₁-C₆alkyl), heterocyclic or heterocyclic(C₁-C₆alkyl);

R₁₅ is hydrogen, C₁-C₆alkyl or an acyl group;

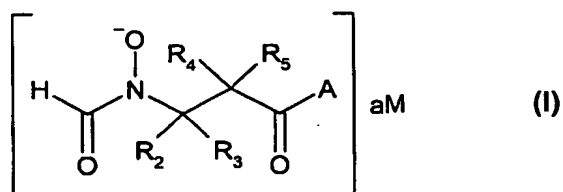
X is -CH₂-, -S-, -CH(OH)-, -CH(OR)-, -CH(SH)-, -CH(SR)-, -CF₂-, -C=N(OR)- or -CH(F)-, wherein R is alkyl;

R₁ is aryl or heteroaryl; and

n is 0-3, provided that when n is 0, X is -CH₂-;

comprising dissolving the amorphous, non-salt form of the compound of formula (I) in a suitable solvent, contacting the dissolved compound with a base and with a metal salt, under conditions suitable to form the desired crystalline salt of formula (I).

14. A method for treating and/or preventing an infectious disorder in a subject, comprising administering to the subject an effective amount of a crystalline salt of formula (I):



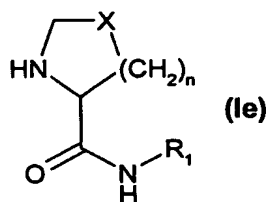
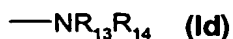
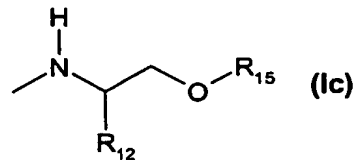
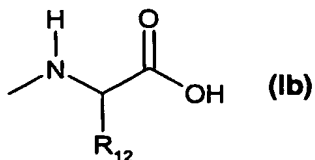
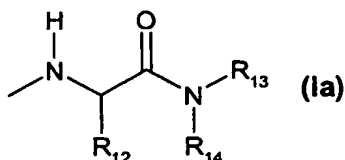
wherein

M is a mono- or di-valent metal;

a is $\frac{1}{2}$ or 1;

each of R_2 , R_3 , R_4 and R_5 , independently, is hydrogen or an aliphatic group, or (R_2 or R_3) and (R_4 or R_5), collectively, form a C_4 - C_7 cycloalkyl;

A is of the formula (Ia), (Ib), (Ic), (Id) or (Ie)



wherein

R_{12} is the side-chain of a natural or a non-natural alpha amino acid;

R_{13} and R_{14} , independently, represent hydrogen, or optionally substituted C_1 - C_8 alkyl, cycloalkyl, aryl, aryl(C_1 - C_8 alkyl), heterocyclic or heterocyclic(C_1 - C_8 alkyl);

R_{15} is hydrogen, C_1 - C_8 alkyl or an acyl group;

X is $-\text{CH}_2-$, $-\text{S}-$, $-\text{CH}(\text{OH})-$, $-\text{CH}(\text{OR})-$, $-\text{CH}(\text{SH})-$, $-\text{CH}(\text{SR})-$, $-\text{CF}_2-$, $-\text{C}=\text{N}(\text{OR})-$ or $-\text{CH}(\text{F})-$, wherein R is alkyl;

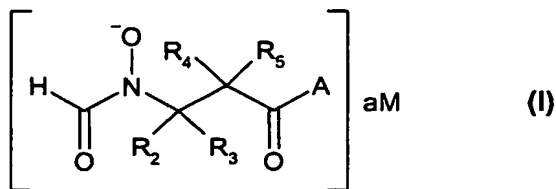
R_1 is aryl or heteroaryl; and

n is 0-3, provided that when n is 0, X is -CH₂-;

or a prodrug thereof.

15. The method of Claim 14, comprising co-administration of a therapeutically effective amount of the crystalline salt of formula (I), or a prodrug thereof, and a second therapeutic agent.

16. A pharmaceutical composition comprising a crystalline salt of formula (I),



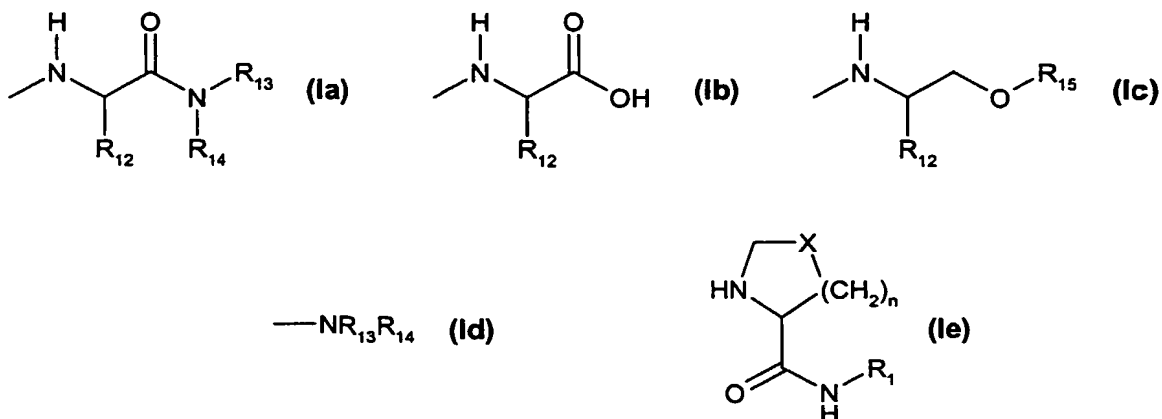
wherein

M is a mono- or di-valent metal;

a is $\frac{1}{2}$ or 1;

each of R₂, R₃, R₄ and R₅, independently, is hydrogen or an aliphatic group, or (R₂ or R₃) and (R₄ or R₅), collectively, form a C₄-C₇cycloalkyl;

A is of the formula (Ia), (Ib), (Ic), (Id) or (Ie)



wherein

R₁₂ is the side chain of a natural or a non-natural alpha amino acid;

R₁₃ and R₁₄, independently, represent hydrogen, or optionally substituted C₁-C₈alkyl, cycloalkyl, aryl, aryl(C₁-C₆alkyl), heterocyclic or heterocyclic(C₁-C₆ alkyl);

R₁₅ is hydrogen, C₁-C₆alkyl or an acyl group;

X is $-\text{CH}_2-$, $-\text{S}-$, $-\text{CH}(\text{OH})-$, $-\text{CH}(\text{OR})-$, $-\text{CH}(\text{SH})-$, $-\text{CH}(\text{SR})-$, $-\text{CF}_2-$, $-\text{C}=\text{N}(\text{OR})-$ or $-\text{CH}(\text{F})-$, wherein R is alkyl;

R_1 is aryl or heteroaryl; and

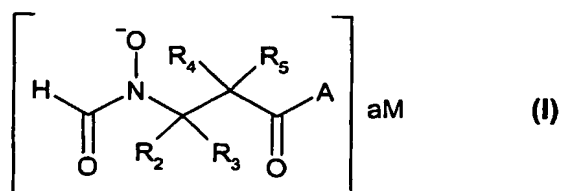
n is 0-3, provided that when n is 0, X is $-\text{CH}_2-$;

or a prodrug thereof,

in association with a pharmaceutically acceptable diluent or carrier therefor.

17. A composition according to claim 16 further comprising a second therapeutic agent.

18. Use of a crystalline salt of formula (I):



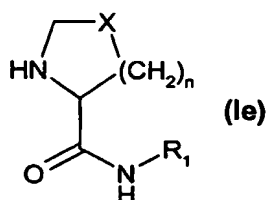
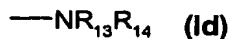
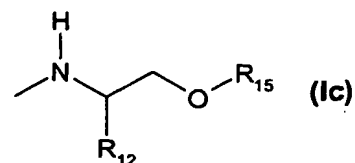
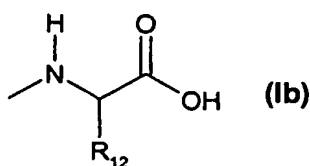
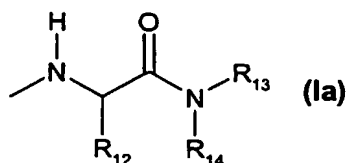
wherein

M is a mono- or di-valent metal;

a is $\frac{1}{2}$ or 1;

each of R_2 , R_3 , R_4 and R_5 , independently, is hydrogen or an aliphatic group, or (R_2 or R_3) and (R_4 or R_5), collectively, form a C_4 - C_7 cycloalkyl;

A is of the formula (Ia), (Ib), (Ic), (Id) or (Ie)



wherein

R_{12} is the side-chain of a natural or a non-natural alpha amino acid;

R_{13} and R_{14} , independently, represent hydrogen, or optionally substituted C_1 - C_8 alkyl, cycloalkyl, aryl, aryl(C_1 - C_8 alkyl), heterocyclic or heterocyclic(C_1 - C_8 alkyl);

R_{15} is hydrogen, C_1 - C_6 alkyl or an acyl group;

X is $-CH_2-$, $-S-$, $-CH(OH)-$, $-CH(OR)-$, $-CH(SH)-$, $-CH(SR)-$, $-CF_2-$, $-C=N(OR)-$ or $-CH(F)-$, wherein R is alkyl;

R_1 is aryl or heteroaryl; and

n is 0-3, provided that when n is 0, X is $-CH_2-$;

or a prodrug thereof, optionally together with a second therapeutical agent, in the manufacture of a medicament method for treating and/or preventing an infectious disorder.